

## CLAIMS

1. A microwave powered lamp comprising:
  - a light reflective cavity;
  - an electrodeless bulb contained in the light reflective cavity from which light is emitted when the electrodeless bulb is excited by microwaves;
  - a magnetron for providing the microwaves for exciting the electrodeless bulb;
  - a waveguide which couples the microwaves emitted by the magnetron to the light reflective cavity for exciting the electrodeless bulb;
  - a housing which contains the lamp;
  - a detector disposed within the housing, which detects the microwaves which are not coupled to the bulb during operation of the magnetron and outputs a signal indicative of a level of received microwaves;
  - and
  - a magnetron control, coupled to the detector, which causes the magnetron to be turned off when a level of the signal indicates the level of received microwaves exceeds a threshold.

2. A lamp in accordance with claim 1 wherein:

the detector comprises an electrical field probe disposed in the waveguide at a location which produces a response to microwaves not coupled to the bulb sufficient to detect when the bulb is not ignited during magnetron operation and the magnetron control is a control circuit which produces a control signal for turning off the magnetron by removing electrical power from the magnetron when the threshold is exceeded.

3. A lamp in accordance with claim 2 wherein:

the electrical field probe is located at an electrical field maximum in the waveguide.

4. A lamp in accordance with claim 1 wherein:

the detector comprises an antenna located within the housing which receives spurious microwaves leaking from any of at least one of the magnetron, waveguide or light reflective cavity which produces a response to the spurious microwaves sufficient to detect when the electrodeless bulb is not ignited during magnetron operation and the magnetron control is a control circuit which produces a control signal for turning off the magnetron by removing electrical power from the magnetron when the threshold is exceeded.

5. A lamp in accordance with claim 1 wherein:  
the magnetron control comprises a power supply of the magnetron and the electrical power from the power supply to the magnetron is reduced when the signal indicates the level of received microwaves exceeds the threshold for a set period of time.

6. A lamp in accordance with claim 2 wherein:  
the magnetron control comprises a power supply of the magnetron and the electrical power from the power supply to the magnetron is reduced when the signal indicates the level of received microwaves exceeds the threshold for a set period of time.

7. A lamp in accordance with claim 3 wherein:  
the magnetron control comprises a power supply of the magnetron and the electrical power from the power supply to the magnetron is reduced when the signal indicates the level of received microwaves exceeds the threshold for a set period of time.

8. A lamp in accordance with claim 4 wherein:

the magnetron control comprises a power supply of the magnetron and the electrical power from the power supply to the magnetron is reduced when the signal indicates the level of received microwaves exceeds the threshold for a set period of time.

9. A method of control of a microwave powered lamp including a light reflective cavity, an electrodeless bulb contained in the light reflective cavity from which light is emitted when the electrodeless bulb is excited by microwaves, a magnetron for providing the microwaves for exciting the electrodeless bulb, a waveguide which couples microwaves emitted by the magnetron to the light reflective cavity for exciting the electrodeless bulb, a housing which contains the lamp, a detector disposed within the housing which detects microwaves which are not coupled to the bulb during operation of the magnetron and a magnetron control coupled to the detector for controlling activation of the magnetron comprising:

providing a signal from the detector indicative of a level of detected microwaves; and

the magnetron control reduces power to the magnetron when a level of the signal indicates the level of the detected microwaves exceeds a threshold.

10. A method in accordance with claim 9 wherein:

the detector comprises an electrical field probe disposed in the waveguide at a location which produces a response to microwaves not coupled to the bulb sufficient to detect when the bulb is not ignited during magnetron operation and the magnetron control is a control circuit which produces a control signal for turning off the magnetron by removing electrical power from the magnetron when the threshold is exceeded.

11. A method in accordance with claim 10 wherein:

the electrical field probe is located at an electrical field maximum in the waveguide.

12. A method in accordance with claim 9 wherein:

the detector comprises an electrical field probe disposed in the wave guide at a location which produces a response to microwaves not coupled to the bulb sufficient to detect when the bulb is not ignited during magnetron operation and the magnetron control is a control circuit which produces a control signal for turning off the magnetron by removing electrical power from the magnetron when the threshold is exceeded.

13. A method in accordance with claim 9 wherein:

the magnetron control comprises a power supply of the magnetron and the electrical power from the power supply to the magnetron is reduced when the signal indicates the level of received microwaves exceeds the threshold for a set period of time.

14. A method in accordance with claim 10 wherein:

the magnetron control comprises a power supply of the magnetron and the electrical power from the power supply to the magnetron is reduced when the signal indicates the level of received microwaves exceeds the threshold for a set period of time.

15. A method in accordance with claim 11 wherein:

the magnetron control comprises a power supply of the magnetron and the electrical power from the power supply to the magnetron is reduced when the signal indicates the level of received microwaves exceeds the threshold for a set period of time.

16. A method in accordance with claim 12 wherein:  
the magnetron control comprises a power supply of the  
magnetron and the electrical power from the power supply to the magnetron is  
reduced when the signal indicates the level of received microwaves exceeds  
the threshold for a set period of time.